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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/534,690 | 10/12/2005 | Yoshiyuki Ochi | DK-US055091 | 5600 |

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| EXAMINER | |
|---|---|
| KASTURE, DNYANESH G | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3746 | |

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| 03/12/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/534,690 | OCHI ET AL. | |
| | Examiner | Art Unit | |
| | DNYANESH KASTURE | 3746 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *19 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *3-5 and 8-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-5 and 8-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 19, 2008 has been entered.

### *Claim Objections*

2. The previously made objection to Claims 1 and 6 are hereby withdrawn in view of cancellation of the claims on November 19, 2008.

### *Claim Rejections - 35 USC § 112*

3. The previously made 112 2nd paragraph rejections of claims 3, 5, 8 and 10 are hereby withdrawn in view of amendments to the claims submitted on November 19, 2008.

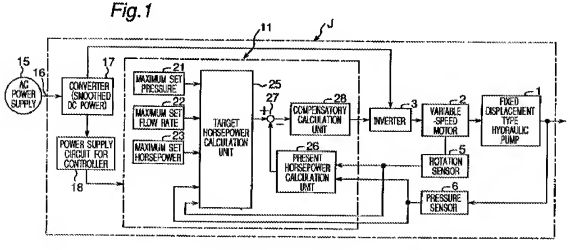
***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 3 - 5 and 8 - 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al (PCT Publication WO01/21959) in view of Chandler et al (US Patent 3,593,103 A) as extrinsically evidenced by Applicant's disclosure of Prior Art (hereafter referred to as "Prior") and further in view of Fujita (US Patent 3,440,508 A)

*Fig. 1*

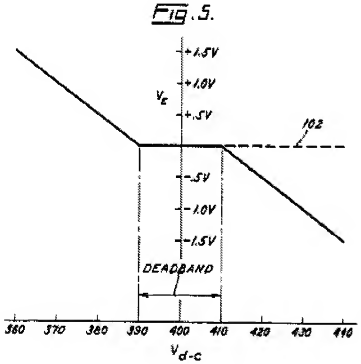



6. In Re claim 3 and 8, with reference to Figure 1 depicted above, Horiuchi et al discloses a pump driving method comprising:

- driving a motor (2) using a controller (11) which executes commands (values)

- carrying out feedback control of the discharge pressure using the signal from the pressure sensor (6) (as described in line 3, Page 4, Paragraph [0021])
- driving a pump (1) using motor (2) (as described in line 14, Page 4, Paragraph [0021])
- an apparatus (11), (21), (22), (23), (25), (27), (28) that is capable of making changes to the control algorithm if necessary

7. However, Horiuchi et al does not disclose changing the command value in correspondence with a changing amount of a detected power source voltage.



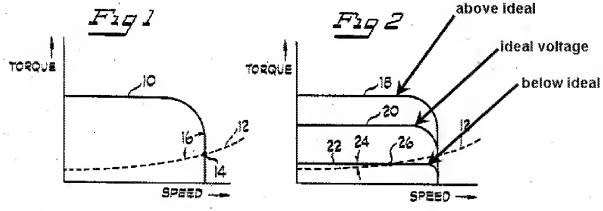

8. Nevertheless, with reference to Figure 5 depicted above, Chandler et al discloses a control circuit (Figure 3) for an inverter (40) that drives the motor comprising:

- coupling line (88) to the DC bus from DC Rectifier (20)

- a voltage sensing circuit (90) that generates a representative control signal $V_E$ that has a command value which is proportional to the deviation of the bus voltage from a predetermined magnitude range or deadband (Column 4, Lines 58-62)
- Referring to Figure 5, in a condition when the detected power source voltage increases, the magnitude (command value) of the control signal $V_E$ also increases

9. It would have been obvious to a person having ordinary skill in the art at the time of the invention to incorporate the control circuit including the voltage sensing means of Chandler et al to drive the inverter of Horiuchi et al for the purpose of "systematically controlling the exchange of electrical and mechanical energy between a variable frequency static inverter and its variable speed rotating load during periods of sudden and abnormal increase or decrease of the input power to the inverter" as stated by Chandler et al in Column 1, Lines 73 – 75 and Column 2, Lines 1 – 2.

10. Horiuchi et al modified by Chandler et al as discussed above disclose all the claimed limitations except for defining a pre-determined pressure, flowing amount, and horse power as characteristics values for a predetermined power voltage.

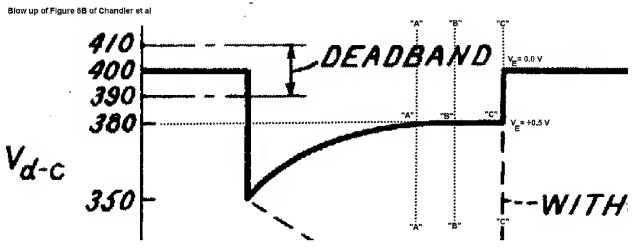


11. Nevertheless, Page 3, Line 9 of applicant's specification under Background Art ("Prior") states that the pressure-flow rate characteristics have equivalent torque-speed characteristics for the motor driving the pump ("This P-Q characteristic can be converted to torque-revolution speed characteristic of a motor.."). Further, Figure 2 of Fujita depicted above discloses additional evidence how the torque-speed characteristics vary with supply voltage as shown by the family of torque-speed characteristics curves (Column 2, Lines 34-36). Since the supply voltage provides power to run the motor, Prior and Fujita disclose pressure-flow rate characteristics (and therefore power) for a given power voltage. Note that Horiuchi et al discloses in Column 4, Line 30 that horsepower = flow rate * pressure.

12. It would have been obvious to a person having ordinary skill in the art at the time of the invention to program the controller of Horiuchi et al to account for the changing pressure – flow rate characteristics with power voltage as taught by Fujita and evidenced by Prior for the purpose of providing stability as suggested by Fujita in Column 1, Line 19 and for the purpose of better controlling the motor under abnormal increase or decrease of the input power voltage as taught by Chandler et al.

13. In Re claims 4 and 5, Horiuchi et al and Chandler et al as applied to claims 3 and 8 disclose all the claimed limitations:

- Chandler et al discloses driving the motor based on the value of the control signal $V_E$ which is zero when the DC voltage of the inverter is the "ideal" value, and non-zero when it is not the ideal value.
- When the system is on its way back to normal conditions after a temporary dip in the input power voltage, the value of the control signal $V_E$ changes from what it was during the dip
- For the duration of the dip in input power voltage, control signal $V_E$ maintains its value




14. With reference to applicant's arguments, as annotated in the Blow-up of Figure 6B depicted above, once the power outage occurs, Vd-c stabilizes at 380 Volts at point "A" in time and stays at that value for the duration of the power outage up until point "C". From Figure 5, the corresponding value of $V_E$ is +0.5 Volts (for Vd-c = 380 Volts). Therefore the value of $V_E$ stabilizes at +0.5 volts at point "A". Point "A" marks the time when the command value is "last changed". Moving now to point "B", the last changed command value of +0.5 volts is "maintained" even though the DC voltage Vd-c = 380

volts is "judged not to be the ideal value". Any point in time between points "A" and "B" is at a condition that reads on the claim limitation "maintaining the last changed command value upon judging that the detected DC voltage is not the ideal DC value of the alternating current power source". At point "C" when power is restored, the "detected DC voltage value" now becomes the "ideal DC voltage value" of 400 Volts, at the same time "changing the command value" from +0.5 volts to 0.0 volts. The transition that occurs at point "C" therefore reads on the claim limitation "changing the command value for the detected DC voltage upon judging that the detected DC voltage is the ideal DC voltage value of the alternate current power voltage".

15. In Re claims 9 and 10, Chandler et al discloses the control circuit with the sensing means (90) "judges" whether the detected voltage is the ideal value, and changes the control signal $V_E$ based on variations of the input power source voltage. The value of the control signal $V_E$ remains non-zero throughout the power dip condition.

16. In Re claim 11 and 13, Chandler et al discloses that the value of the control signal $V_E$ decreases during the return to normal time period after a temporary rise in the input voltage.

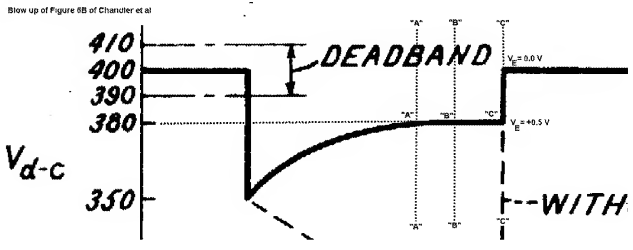
17. In Re claim 12 and 14, Figure 6 of Chandler et al depicts that the "soft return" time is greater than the power loss time (T2 - T1). In this case, the return voltage is not higher than its normal value within the deadband, therefore the increase in speed is less

than a value that would correspond to excessive speed (second pre-determined value). Also, during the power dip, the speed is less than normal (first predetermined value). Note also that phrase "soft return" implies that the voltage has returned to normal and is therefore at ideal value.

***Response to Arguments***

18. Applicant has argued that Chandler et al does not disclose the claim limitation "maintaining the last changed command value upon judging that the detected DC voltage is not the ideal DC value of the alternating current power source" and "changing the command value for the detected DC voltage upon judging that the detected DC voltage is the ideal DC voltage value of the alternate current power voltage".

19. Examiner's response: The examiner has carefully considered applicant's argument, however it is not persuasive for the reasons above (repeated below). The examiner therefore respectfully disagrees with applicant's arguments.



20. As annotated in the Blow-up of Figure 6B depicted above, once the power outage occurs, Vd-c stabilizes at 380 Volts at point "A" in time and stays at that value for the duration of the power outage up until point "C". From Figure 5, the corresponding value of $V_E$ is +0.5 Volts (for Vd-c = 380 Volts). Therefore the value of $V_E$ stabilizes at +0.5 volts at point "A". Point "A" marks the time when the command value is "last changed". Moving now to point "B", the last changed command value of +0.5 volts is "maintained" even though the DC voltage Vd-c = 380 volts is "judged not to be the ideal value". Any point in time between points "A" and "B" is at a condition that reads on the claim limitation "maintaining the last changed command value upon judging that the detected DC voltage is not the ideal DC value of the alternating current power source". At point "C" when power is restored, the "detected DC voltage value" now becomes the "ideal DC voltage value" of 400 Volts, at the same time "changing the command value" from +0.5 volts to 0.0 volts. The transition that occurs at point "C" therefore reads on the claim limitation "changing the command value for the detected DC voltage upon judging that the detected DC voltage is the ideal DC voltage value of the alternate current power voltage".

***Conclusion***

21. A note to the applicant: The claim limitation "defining a predetermined pressure, flowing amount, and horse power as characteristic values for a predetermined power voltage" in claims 3 and 8 is isolated and it is not clear what bearing this definition has

on the rest of the claim or any of the other claims. The definition is not used again, therefore it appears unnecessary. It is not clear what the advantage is of defining the pressure, flow and horsepower as a characteristic values.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DNYANESH KASTURE whose telephone number is (571)270-3928. The examiner can normally be reached on Mon-Fri, 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272 - 7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

DGK